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Small Quantity Generator's Handbook for Managing RCRA (Resource Conservation and Recovery Act) Wastes Printing and Publishing

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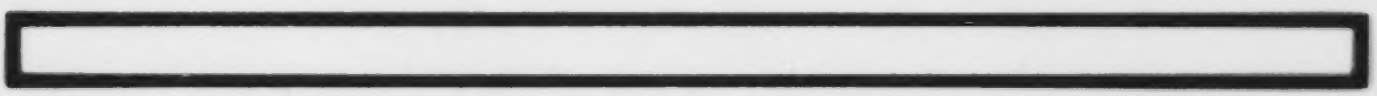

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THE SMALL QUANTITY GENERATOR'S HANDBOOK FOR MANAGING RCRA WASTES

- PRINTING AND PUBLISHING -

STATE OF MONTANA
DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES
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This RCRA Handbook was developed for the printing and publishing industries to provide assistance in complying with pertinent sections of the RCRA requirements. Section 2 summarizes printing operations and describes the characteristics of wastes generated and general waste management practices. Section 3 describes how these waste types may be subject to the RCRA and ARM regulations based on how they are managed and on their specific characteristics. Section 4 discusses the RCRA generator requirements, while Section 5 describes waste management strategies for minimizing the amount of hazardous waste generated by printing businesses. Appendix A is a listing of acute and toxic hazardous wastes used for regulatory purposes (F, P, and U wastes). Appendix B provides a summary of RCRA characteristic wastes. Appendix C contains a list of references and contacts for obtaining more information about hazardous wastes and their regulation.

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Prepared for:

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Helena, Montana

Prepared by:

Science Applications International Corporation
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1.0 INTRODUCTION

In 1976, Congress, recognizing that the problem of solid and hazardous waste disposal had become a national concern, passed the Resource Conservation and Recovery Act (RCRA). This legislation was designed to address two major problems:

- The dangers to human health and the environment posed by improper waste disposal
- The conservation of valuable material and energy resources

Subtitle C of RCRA establishes a "cradle-to-grave" hazardous waste management system, which is administered by the U.S. Environmental Protection Agency (EPA). This system provides for managing, tracking, and regulating hazardous wastes at each step of the way from generation to final disposal. The regulations developed by EPA apply to those who generate, transport, treat, store, or dispose hazardous wastes.

This RCRA Handbook was developed for the printing and publishing industries to provide assistance in complying with pertinent sections of the RCRA requirements. The manual also provides waste management strategies for minimizing waste quantities. Waste minimization has several economic advantages including reducing the costs required to comply with the RCRA requirements and reducing product requirements if waste recycling or reuse is practiced.

The information on the printing operations in this document was compiled through site visits to newspaper and periodical printing and publishing establishments, and commercial printing and graphics businesses. These site visits were conducted to identify the types and quantities of both hazardous and non-hazardous wastes typically generated, and to observe current waste management practices. Following these visits, a review of the RCRA regulations and the Administrative Rules of Montana (ARM) was performed to identify specific regulations applicable to printing and publishing industries.

Section 2.0 of this manual summarizes printing operations and describes the characteristics of wastes generated and general waste management practices. Section 3.0 describes how these waste types may be subject to the RCRA and ARM regulations based on how they are managed and on their specific characteristics. Section 4.0 discusses the RCRA generator requirements, while Section 5.0 describes waste management strategies for minimizing the amount of hazardous waste generated by printing businesses. Appendix A is a listing of acute and toxic hazardous wastes used for regulatory purposes (F, P, and U wastes). Appendix B provides a summary of RCRA Characteristic Wastes. Finally, Appendix C contains a list of references and contacts for obtaining more information about hazardous wastes and their regulation.

2.0 WASTE CHARACTERIZATION

2.1 SUMMARY OF OPERATIONS

The printing industry includes facilities involved in printing and publishing of newspapers, periodicals, and books, as well as commercial and job printing activities. Other printing products can include greeting cards, stationery, business forms, pamphlets, and packaging materials. Activities related to the production and sales of printed materials include the manufacture of printing plates, typesetting, composition, and graphic design.

Printing involves the permanent placement of an image onto a surface using ink. The surface may be paper, metal, fabric, or other substance. The printing process begins with converting the original to be reproduced into a printing plate or image carrier by photomechanical means. The image on the image carrier is then transferred in ink to the desired surface. After the actual printing process has been completed, the ink is dried in ovens or air driers. The printed material then undergoes a variety of finishing processes, the exact nature of which depends on the desired product.

There are four types of printing processes currently in use: letterpress (or relief), screen, gravure, and lithography. These processes differ in their products and the location of the inked image with respect to the printing plate. The types of plates used vary from each process and can consist of zinc, copper, magnesium, aluminum, bimetal, nickel and chromium-plated, and plastic plates. The types of inks used in each process also vary.

Letterpress printing, which is a large category of printing industry, is used in the printing of books, magazines, newspapers, catalogs, and pamphlets. Screen printing is used in printing displays, board and paper posters, metal signs, fabrics, and other materials. Gravure printing is used for long-run printing of magazines, catalogs, newspaper supplements, brochures, letterheads, packaging, and specialty products. Lithography is used in metal printing, commercial literature, books, catalogs, maps, greeting cards, letterheads, business forms, checks, and labels.

2.2 WASTE TYPES

Wastes are produced in the printing industry from the printing processes, platemaking processes, and other related services, such as binding. Although the quantities of wastes produced from these processes will vary from each printing industry, the types and characteristics of the wastes are generally similar in nature. These general waste types and characteristics are described below.

2.2.1 Platemaking Process Wastes

Wastes generated from the platemaking processes include the following:

- Film and plate processing wastes
- Film negatives and transfer papers
- Etching wastes and wash waters
- Used printing plates

The characteristics and common waste management practices of these waste types are described below.

Film and Plate Processing Wastes - Several types of processing chemicals are used in developing films, images, transfers (photo mechanical or PMT), and plates. These processing chemicals include developers, fixers, stabilizers, activators, and other chemicals similar to those used in photographic processing. The use of a particular processing chemical will depend upon the type and amount of developing to be accomplished. Commonly-used types of photographic processing solutions and the general composition of each solution are listed in Table 1. The table provides of listing of the chemicals and their approximate concentrations that may be present in the processing solutions. The processing solutions do not necessarily contain all of the chemicals listed.

Wastes generated from film and plate processing operations include wash waters and processing solutions that need to be periodically disposed. The wash waters contain small amounts of these processing solutions. The processing solutions wasted include spent solutions and process tank overflows.

Table 1

GENERAL COMPOSITION OF PHOTOGRAPHIC PROCESSING SOLUTIONS

Type of Solution and pH Range	Concentrations Range in Grams per Liter		
	less than 1	1 to 10	10 to 100
Activators pH 11 to 14	Antifoggant	Sequestering agent Tetramethylammonium chloride	Carbonate 2-Diethylaminoethanol 2-Methylaminoethanol Phosphate Sulfite Urea
Bleach-Fixers pH 6 to 8		Ferrous and ferric EDTA complexes Accelerators	Ammonium Ferric ethylenediamine-tetraacetate (FeEDTA) Sulfite Thiosulfate
Clearing Baths and Washing Agents pH 5 to 10	Citrate Hydroquinone Sequestering agent		Sulfate Sulfite
Color Developers pH 10 to 12	Antifoggant Citrazinic acid Iodide 1-phenyl-3-pyrazolidone Thiocyanate Boron hydrides	Benzyl alcohol Borate Bromide Citrazinic acid, sodium salt Color developing agents Coupling agent Ethylenediamine Hydroxylamine Polyglycols Sequestering agent Sulfate Sulfite	Benzyl alcohol Borate Carbonate Developing agent Phosphate Sulfate Sulfite
Black-and-White Developers pH 9 to 12	Antifoggant Bromide Ethylenediamine Sequestering agent Iodide Pyrazolidone developing agents	Acetate Borate Bromide Carbonate Catechol Citrate Ethylenediamine Glutaraldehyde Hydroquinone Metacresol Pyrazolidone developing agents Phosphates Polyglycols Sequestering agents p-Methylaminophenol sulfate Sulfite Thiocyanate	Aminoethanol Carbonate Chloride Diaminopropanol Ethylene glycol Formaldehyde Hydroquinone Methylaminoethanol Polyethylene glycols Sequestering agent Sulfite Imino diethanol Tetramethylammonium Borate
Dichromate Bleaches pH 0 to 3		Aluminum Dichromate Sulfate	Acetate Bromide
Ethylenediaminetetra-acetic Acid Bleach pH 5 to 9		EDTA Accelerators	Acetate Ammonium Borate Ferric EDTA (greater than 100) Nitrate
Ferric Chloride Bleaches pH 0 to 1		Citrate	Ferric chloride Citrate
Ferricyanide Bleaches pH 5 to 8		Bicarbonate Nitrate Polyglycols Borate	Bromide Ferricyanide Ferrocyanide Phosphates

Table 1 (cont'd)

Type of Solution and pH Range	Concentrations Range in Grams per Liter		
	less than 1	1 to 10	10 to 100
Fixers pH 4 to 8		Acetate Aluminum Bicarbonate Bisulfite Borate Bromide Citrate Formalin Sequestering agent Silver thiosulfate complex Sulfate Thiocyanate	Acetate Aluminum Ammonium Borate Bromide Chloride Citrate Sulfite Thiocyanate Thiosulfate
Hardeners, Prehardeners pH 3 to 10	Antifoggant Chromium, trivalent Glycine* p-Toluenesulfinic acid	Aluminum Carbonate Formalin Sequestering agent Succinaldehyde Sulfite Trivalent chromium	Acetate Sulfate
Monobaths pH 10 to 11	Antifoggant	Bromide Sequestering agent	Borate Hydroquinone Sulfite Thiosulfate Carbonate
Neutralizers pH 4 to 6	Hydroquinone Sequestering agent	Acetate p-Toluenesulfinic acid	Bromide Citrate Hydroxylamine sulfate Sulfate Formate
Reversal Bleach pH 1		Dichromate	Sulfamic acid Sulfate
Stabilizers pH 4 to 5	Benzoate Wetting agent	Aluminum Antifoggant Benzoate Citrate Phosphate Sequestering agent Sulfate Sulfite	Acetate Ammonium Bicarbonate Bisulfite Formaldehyde Phosphate Sulfate Thiocyanate (>100) not present in color process stabilizers.
Stop Baths pH 2 to 4		Aluminum Borate Citrate	Acetate Diethylene glycol Phosphate Sulfate Benzyl alcohol

* Amino acetic acid, not parahydroxyphenyl glycine which is known commonly as "photographic-grade glycine."

Source: "Chemical Composition of Photographic Processing Solutions," Publication No. J-47, Eastman Kodak Company, Rochester, NY, undated.

The characteristics of these film and plate processing wastes will vary from business to business due to the differences in the types of processing chemicals used, amount of wash water used, and the frequency and amount of processing. These wastewaters will contain some of the process chemicals listed in Table 1 that were not used up during processing, and trace amounts of chemicals leached out of the film and paper emulsions during processing, such as the silver thiosulfate complex.

The most common disposal practice for wastewater generated from film and plate processing is by discharge to a sanitary sewer system where it is collected and treated at a municipal wastewater treatment facility. Reclamation of silver from this wastewater is also a common practice.

Film Negatives and Transfer Papers - Film negatives and transfer papers, such as PMT paper, are waste materials generated during plate processing. The amount of these waste materials generated depends upon the type and size of the plate making operation. A significant amount of silver can remain on the film negatives and PMT paper after processing. Common waste management practices for these materials include disposal at a municipal landfill or collection for offsite recycling, with subsequent reclamation of silver.

Etching Wastes and Wash Waters - A significant amount of waste can be generated from the etching of metallic printing plates. Metal salts, organic solvents, or acids are typically used for etching these metal plates. The etching process involves removal of metal from the printing plate by splashing or spraying the etch against the plate. The waste stream generated from this process would contain the etching solution and metal ions that were removed from the plate. The waste stream is collected and generally discharged to the sanitary sewer system.

After the plates are etched, they are rinsed to remove excess solutions and the etched metals. This wash water becomes waste stream with characteristics similar to the etching waste stream, but more dilute. This waste stream is also typically discharged to a sanitary sewer system.

Used Printing Plates - The printing plates are used for a specific printing process and in some instances, cannot be reused for other printing processes. These plates are made of aluminum, copper, or other type of metal or metal alloy, depending upon the printing process used. Plastic plates are also used in some applications. In situations where these plates cannot be reused, they are commonly taken to a municipal landfill for disposal or collected for offsite recycling in the case of the metal plates.

2.2.2 Printing Process Wastes

Wastes generated from the printing processes include the following:

- Waste inks
- Waste newsprint
- Wash waters from the printing presses and associated equipment
- Cleaning rags
- Empty product containers (solvents and inks)

The characteristics and the more commonly used waste management practices for each of these waste types are described below.

Waste Inks - Inks that are used during the printing operations can periodically become dried out, contaminated, or otherwise unusable. These unusable inks are removed from the printing presses and become a waste material. Waste ink is also generated as a result of equipment and process losses during the normal operation of the printing presses. Unused portions of color inks that are used for a specific job quite often cannot be reused for subsequent tasks and thus become a waste material. The smaller commercial and job printing shops typically generate very small amounts of waste inks. The larger printing operations, such as newspapers, can generate significant amounts of these waste inks. Depending upon the size of the newspaper, the amount of waste ink generated can range from 50 pounds to 250 pounds per month. The waste inks are collected and either taken to a landfill or reclaimed, either onsite or offsite.

Waste Newsprint - Waste newsprint is a typical waste material generated from newspaper printing operations. The amount generated depends upon the size

of the operation. This waste material is usually recycled or taken to a landfill.

Wash Waters - Water is used to wash water soluble inks from the printing presses and associated equipment. These wash waters are typically generated each time a different type or color of ink is used for printing. These wash water will contain the pigments, dyes, and binder portions of the ink. The inks also contain solvents that may be present in small amounts in the wash water. This wash water is typically discharged into a sanitary sewer system, where it is collected and treated at a municipal wastewater treatment facility.

Cleaning Rags - Paper and cloth rags are also used for cleaning the printing plates and presses. Where non-water soluble inks are used, the cleaning process involves wiping the equipment with rags soaked in organic solvents. Where water soluble inks are used, the cleaning process consists of wiping the equipment with rags soaked with water. The waste cleaning rags contain pigments, dyes, and binder portions of the ink, in addition to small amounts of solvents. The waste paper rags are generally collected onsite in a dumpster and taken to a local landfill. The waste cloth rags are generally taken to an industrial laundry service for cleaning.

Empty Containers - Empty containers from the use of inks and cleaning solvents are a common waste generated by all of the printing industry types. These products containers can range in size from pint-size to 55-gallon drums. These containers can be constructed of a plastic or metal material. Current management of these empty containers consists of either returning them to the product distributor for reuse, or crushing or puncturing and disposing of them in a local landfill.

3.0 HAZARDOUS WASTE REGULATIONS

3.1 FEDERAL HAZARDOUS WASTE REGULATIONS

The Federal regulations governing the management of hazardous wastes are specified under the Resource Conservation and Recovery Act (RCRA). The objectives of RCRA are to improve the management of wastes to protect the environment and human health, and to conserve valuable materials and energy resources. The RCRA regulations are specified in the Code of Federal Regulations (CFR), Title 40, Parts 260 through 272. The Environmental Protection Agency has the authority to administer the RCRA program.

3.2 STATE HAZARDOUS WASTE REGULATIONS

In the State of Montana, the Department of Health and Environmental Science (DHES) has been given the authority from EPA to develop and administer a hazardous waste management program. EPA requires that the development and administration of this state program is consistent with the federal standards set forth in the RCRA regulations. The State has developed hazardous waste management regulations under the Montana Hazardous Waste Act of October 1, 1985, which are specified in the Administrative Rules of Montana, Title 16, Chapter 44. This state program incorporates the Federal RCRA standards and includes additional requirements that were developed for the classification, generation, storage, treatment, and disposal of hazardous wastes.

3.3 HAZARDOUS WASTE CLASSIFICATION

RCRA and the Administrative Rules of Montana (ARM) have established certain standards and criteria based on waste characteristics and management practices to determine whether a waste is considered hazardous. If a waste is determined to be hazardous, specific regulations under RCRA and ARM apply to the management of that waste including storage, treatment, and disposal of the waste. Section 3.3.1 describes how a particular waste may be classified as hazardous based on its characteristics or listing. Section 3.3.2 describes how a particular hazardous waste may be exempt from the regulations based on how it is managed.

3.3.1 Listed and Characteristic Hazardous Wastes

There are two ways a waste may be brought into the hazardous waste regulatory system: listing and identification through characteristics.

These classifications are summarized below:

- Listed Wastes - A waste may be considered hazardous if it appears on any one of four lists of hazardous wastes contained in the RCRA regulations. These waste have been listed because they exhibit one of the characteristics described below or contain any number of toxic constituents that have been shown to be harmful to human health and the environment. The RCRA regulations list over 400 hazardous wastes, including wastes derived from non-specific sources (F Wastes), manufacturing processes (K Wastes), and discarded chemical products (P and U Wastes). These lists can be found in the CFR, Title 40, Part 261, Subpart D. Appendix A contains a listing of the F, P, and U wastes.

- Characteristic Wastes - Even though a waste does not appear on one of the above hazardous wastes lists, it may be considered a hazardous waste if it exhibits certain characteristics. A waste may be considered hazardous if it exhibits any one of the following characteristics: ignitable, corrosive, reactive, or EP toxic. These specific characteristics and criteria for identifying the RCRA characteristic wastes are described in detail in Appendix B. These characteristics are referenced in the CFR, Title 40, Part 261, Subpart C.

3.3.2 Exemptions Based on Waste Management Practices

Specific waste management practices are not subject to the RCRA and ARM regulations. Generally, these exemptions apply to the management of process wastewaters. Sanitary sewer discharges and direct surface water discharges of the process wastewaters are generally not subject to these RCRA and ARM hazardous waste regulations. The RCRA and ARM hazardous waste regulations would, however, apply to those wastewater management options other types of onsite or offsite treatment and disposal. These wastewater management options and their applicability to the RCRA and ARM regulations are described below. In all cases, the business should consult DHES and local authorities to determine whether the exemptions are applicable to the specific practice carried out at the facility.

Sanitary Sewer Discharge - Process wastewaters discharged to the sanitary sewer system may be subject to local restrictions or limitations. Municipalities or city governments will often establish restrictions or limitations on specific parameters in the wastewater to protect the wastewater treatment facility. Toxic parameters present in the process wastewaters may interfere with or disrupt the operation of the wastewater treatment facility. These discharge restrictions or limitations are often imposed through a local sewer use ordinance, administrative code, or permit system. Businesses intending to discharge process wastewaters to the sanitary sewer system should check with their local government to determine what restrictions or limitations apply and if a discharge permit is required.

Process wastewaters that are discharged to the sanitary sewer system where they are collected and treated in a municipal wastewater treatment facility are not subject to the RCRA and ARM hazardous wastes regulations. Process wastewaters included film and plate processing wastes, etching wastes and wash waters, and wash waters from cleaning printing presses. These wastewaters, even though they may be RCRA-listed wastes or exhibit RCRA characteristic wastes, are excluded from RCRA and ARM control based on the domestic sewage exemption. For this exemption to apply, the process wastewater must be discharged along with domestic sewage to the municipal wastewater treatment facility. If process wastewaters are not discharged along with domestic sewage, then the domestic sewage exemption does not apply and the wastewaters may be subject to the RCRA and ARM regulations. Section 3.4.2 describes how these wastes may be subject to these regulations based on their characteristics.

Surface Water Discharges - Process wastewaters discharged to a surface water under NPDES permit, such as a direct discharge to a lake or stream, or to a storm sewer, are not subject to the RCRA and ARM regulations. These discharges, however, are subject to the Federal Clean Water Act and ARM 304(1)(g). This act places restrictions and limitations on specific wastewater parameters that can be discharged. Businesses discharging to a surface water are required to obtain a discharge permit (NPDES permit) from the Montana DHES Water Quality Bureau. To meet the discharge limitations,

the process wastewaters must generally be extensively treated onsite prior to discharge. Wastewaters containing hazardous wastes cannot be discharged to surface waters.

3.4 APPLICABILITY OF FEDERAL AND STATE HAZARDOUS WASTE REGULATIONS TO PRINTING WASTES

Wastes generated from the platemaking processes and printing processes may be subject to the RCRA and ARM hazardous waste regulations, depending upon their specific characteristics and how they are managed. The determination of applicable hazardous waste regulations to printing wastes is a two step process involving: (1) determining types of wastes generated and if a particular waste is classified as a hazardous waste and; (2) determining how each waste type is managed. The following discussion identifies those particular wastes generated from the printing industries that may be classified as hazardous wastes based on their listing or characteristics and what regulations apply to the management of that waste.

3.4.1 Film and Plate Processing Wastes

Generally, film and plate processing wastewaters would not be included in any of the four lists of hazardous wastes. Therefore, film and plate processing wastewaters would probably not be listed hazardous wastes.

Film and plate processing wastewaters, however, may be classified as hazardous wastes based on their characteristics. Some parameters in these wastewaters may exhibit one of the four characteristics of ignitability, reactivity, corrosive, or EP toxic. Specific parameters of interest in film and plate processing wastewaters that may exhibit these characteristics include:

- pH - Some film and plate processing solutions have pH values that may classify them as corrosive. This is the case if a solution has a pH of less than or equal to 2.0 or greater than or equal to 12.5. Table 1 showed that some processing solutions had these extreme pH values. For example, dichromate bleaches have a pH of 0.0 to 1.0, thus would be considered as a corrosive waste if disposed.

- Silver - Wastewaters from fixer and bleach-fixer solutions contain silver in significant quantities. The silver is generally in the form of silver thiosulfate. If the EP toxicity test were conducted on this wastewater, it may contain silver in concentrations above the 5.0

milligrams per liter (mg/L) limit. Wastewater with silver concentrations measured by the EP toxicity test in excess of 5.0 mg/L exhibit the characteristic of EP toxicity, and thus be classified as a hazardous waste.

- Chromium - Wastewaters from bleaches and cleaning solutions may contain chromium. Chromium is also an EP toxic metal. Wastewater with chromium concentrations as measured by the EP toxicity test, in excess of 5.0 mg/L exhibits the characteristic of EP toxicity, and would be classified as a hazardous waste.

- Cyanides - Wastewaters containing ferrocyanide and ferricyanide bleaches may be classified as reactive, due to the cyanide content of the wastewater. Under certain conditions, toxic cyanide gases may be generated in sufficient quantities to present a danger to human health.

Film and plate processing wastewaters exhibiting any of these characteristics are classified as hazardous wastes and are subject to specific requirements of the RCRA and ARM regulations as described in Section 4.0. These requirements apply if the process wastewaters are treated or disposed onsite or offsite, such as the use of a contracted waste pick-up and disposal service. Process wastewaters that are discharged to a sanitary sewer system along with domestic sewage or discharged to a surface water under NPDES permit as described in Section 3.3.2 are not subject to these requirements.

Silver Reclamation From Film and Plate Processing Wastewaters - The recovery of silver from film and plate processing wastewater is a practice commonly employed by many of the printing businesses. The RCRA and ARM regulations do not specifically address silver recovery of photographic processing wastewaters. However, these regulations do contain general requirements for the recycling or reclamation of hazardous wastes.

Silver reclamation operations are excluded from these regulations only if the process wastewater after reclamation is being discharged to the sanitary sewer along with domestic sewage. Silver reclamation operations where process wastewaters are not discharged to the sanitary sewer under these conditions may be subject to the RCRA and ARM regulations if the wastewater exhibits any of the RCRA characteristics.

Regardless of whether the recovery operations are regulated, the silver that is recovered is a hazardous waste as long as it is being stored onsite. The amount of silver recovered in a month's period should be included in the determination of a generator's status (see Section 4.0). Both large and small generators are subject to the recycling regulations which are specified in 40 CFR 266, Subpart F. These recycling regulations specify requirements for storage, transportation, and record keeping for the recycled materials.

Most printing operations involved in film and plate processing, with or without silver recovery systems, are classified as conditionally exempt or small generators (less than 1,000 kilograms per month). The silver recovery systems for these process wastewaters generate very small quantities of silver, generally on the order of less than one pound in a period of a year. As such, recovered silver from film and plate processing wastewaters are subject to the conditionally exempt generator regulations as outlined in Section 4.0.

3.4.2 Etching Waste and Wash Waters

Etching wastewaters typically contain etching solutions and dissolved metal ions removed from the plate. The commonly used etching solutions included organic solvents, metal salts, and acids. These etching wastewaters may be classified as hazardous wastes as a result of the etching solution used or the dissolved metal ions concentration.

Those etching solutions of concern that could render the wastewater hazardous include the organic solvents and the acids. Some organic solvents are listed wastes based on their inclusion in the "F list" (See Appendix A). Other types of organic solvents are not listed wastes but exhibit the characteristic of ignitability. The constituents of a particular solvent used for etching should be identified and a determination should be made if it is listed or characteristic hazardous waste. Wastewaters that contain listed solvents also become hazardous wastes. Wastewaters that contain RCRA characteristic solvents are also hazardous wastes if the wastewater mixture exhibits any of the RCRA characteristics.

Wastewaters containing acids used for etching solutions may also be classified as hazardous if they exhibit the characteristic of corrosivity. Depending upon the strength and amount of the acid used, the wastewater may have a pH of less than 2.0. If the wastewaters exhibit this characteristic, they must be managed as hazardous wastes.

The wastewaters also contain dissolved metal ions removed from the plate during etching; the metal ions present will depend upon the composition of the plate being etched. These wastewaters may exhibit the characteristic of EP toxicity based on their metal content. Lead, chromium, and silver are metals typically found in these wastewaters that are EP toxic. Wastewaters containing these metals in concentrations above the limits specified (see Appendix B) are considered hazardous wastes and must be managed as such.

Wash waters from plate etching operations contain those parameters found in the etching waste stream, only more dilute. These wash water may be considered hazardous if they: (1) contain solvents that are listed or characteristic hazardous wastes, or (2) exhibit any of the RCRA characteristics due to the presence of acids or metal ions.

Etching wastes and wash waters classified as hazardous as described above are subject to specific requirements of the RCRA and ARM regulations, which are described in Section 4.0. These requirements apply if the process wastewaters are treated or disposed onsite or offsite, such as the use of a contracted waste pick-up and disposal service. Process wastewaters that are discharged to a sanitary sewer system along with domestic sewage or discharged to a surface water under NPDES permit as described in Section 3.3.2 are <u>not</u> subject to these requirements.

3.4.3 <u>Waste Inks</u>

Some types of inks used in the printing operations contain inorganic pigments such lead, cadmium, or chromium. Waste inks may exhibit the characteristic of EP toxicity due to the presence of heavy metals in significant concentrations. Waste inks containing one or more of these metals in concentrations above the limits specified (see Appendix B) are considered hazardous wastes and must be managed as such.

Waste inks classified as hazardous wastes as described above are subject to specific requirements of the RCRA and ARM regulations, which are described in Section 4.0. These requirements apply if the waste inks are reclaimed either onsite or offsite or disposed offsite.

3.4.4 Wash Waters from Printing Presses

Solubilized inks are the main component of wash waters generated from cleaning the printing presses and associated equipment. These wash waters may exhibit the characteristic of EP toxicity due to the presence of inks that contain lead, chromium, or other heavy metals. Wash waters containing one or more of these metals in concentrations above the limits specified (see Appendix B) are considered hazardous wastes and must be managed as such.

Wash waters from printing presses that are classified as hazardous as described above are subject to specific requirements of the RCRA and ARM regulations, which are described in Section 4.0. These requirements apply if the process wastewaters are treated or disposed onsite or offsite, such as the use of a contracted waste pick-up and disposal service. Process wastewaters that are discharged to a sanitary sewer system along with domestic sewage or discharged to a surface water under NPDES permit as described in Section 3.3.2 are not subject to these requirements.

3.4.5 Empty Containers

Containers that have held solvents, acids, or inks that are classified as hazardous based on their listing or characteristics, may be considered as hazardous wastes if not properly emptied. For these product containers to be exempt from hazardous waste regulations, the following conditions must apply:

- Containers are being reused or recycled. This includes containers that are returned to the vendor or distributor to be reused.
- Containers are being discarded but are considered empty as defined in RCRA and ARM regulations. The definition of empty is explained below.

An empty container is defined as follows:

- All wastes have been removed that can practically be removed by methods of pouring, pumping, or aspirating, and
- No more than 2.5 centimeters (1 inch) of residue remains on the bottom of the container, or
- For containers less than or equal to 110 gallons in size: No more than 3 percent by weight of the total capacity of the container remains in the container. For containers greater than 110 gallons in size: No more than 0.3 percent by weight of the total capacity of the container remains in the container.

3.4.6 Non-Hazardous Wastes

Film negatives and transfer papers, used printing plates, cleaning rags, and waste newsprint are wastes that would typically not be classified as hazardous wastes. As such, these wastes are not subject to the RCRA and ARM hazardous waste regulations. However, economic and environmental factors should be considered when managing these wastes. Waste recycling is one such management practice that considers these factors. These recycling methods for non-hazardous wastes are described in Section 5.0.

4.0 HAZARDOUS WASTE GENERATOR REQUIREMENTS

4.1 BACKGROUND

The Environmental Protection Agency (EPA) and the Montana Department of Health and Environmental Science (DHES) classify generators of hazardous waste in three categories according to the amount of waste they generate. This classification was done in response to public attention to the fact the inappropriate management of even small quantities of hazardous waste can result in health or environmental problems. Depending on which generator category applies to a specific business, certain precautions or actions may be required in the management of hazardous wastes.

4.2 CATEGORIES OF GENERATORS

Businesses that generate 1,000 kilograms or more (2,200 pounds) per month of hazardous waste (or one kilogram per month of acute hazardous waste) must abide by all of the requirements of the law, and are not eligible for any exemptions. These are classified as large hazardous waste generators. Requirements for this category are not addressed in this manual.

Businesses generating between 100 kilograms and 1,000 kilograms (220 pounds to 2,200 pounds) per month of hazardous waste have been designated as **SMALL GENERATORS** and are allowed some special provisions. Finally, businesses that generate less than 100 kilograms (220 pounds) per month of hazardous waste are designated as **CONDITIONALLY EXEMPT GENERATORS**.

4.3 REQUIREMENTS FOR ALL GENERATORS

Each of the requirements that are described below apply to all generators, regardless of quantity. These are summaries of the Federal regulations and the State of Montana's regulations. The Federal regulations for hazardous waste generators are found in the Code of Federal Regulations, Title 40, Parts 261 and 262 (40 CFR 261 and 262) and are administered by EPA. The State of Montana's rules for hazardous waste generators are found in the Administrative Rules of Montana, Title 16, Chapter 44, and administered by DHES.

It is important to note that the Federal laws apply nationwide. In some cases, requirements that have been added to the original Federal laws have not yet been adopted by the State of Montana. Even if the State has not yet adopted certain requirements from the Federal law, businesses are still required to abide by these Federal requirements. In addition, the State of Montana may have developed special requirements to address special problems within the state.

- All generators must determine which of the wastes they generate are hazardous. Sections 2.0 and 3.0 of this guidance manual contains descriptions of the hazardous wastes generated in a specific type of business. [40 CFR 262.11, ARM 16.44.402]

- All generators must segregate <u>listed</u> (F, K, P and U) hazardous wastes from non-hazardous wastes. Listed hazardous wastes are materials that have been specifically catalogued and are always considered hazardous. MIXING THESE WASTES WITH NON-HAZARDOUS WASTE WILL MAKE THE ENTIRE VOLUME A HAZARDOUS WASTE. Sections 2.0 and 3.0 of this guidance manual identified listed hazardous wastes that may be generated in your business. The F, P, and U wastes are listed in Appendix A.

- Under certain circumstances, generators may mix characteristic hazardous wastes and non-hazardous wastes if they are compatible (not reactive or explosive, etc.). The mixture is considered non-hazardous only if it no longer meets the characteristics of a hazardous waste. IF THE MIXTURE IS A WASTE EXHIBITING A HAZARDOUS CHARACTERISTIC, THE ENTIRE MIXTURE BECOMES A HAZARDOUS WASTE, AND THE SMALL GENERATOR MAY BECOME A LARGE GENERATOR AS A RESULT. Section 3.0 and Appendix B of this guidance manual identify the characteristics of hazardous waste that may apply to your business.

- In the event of a hazardous waste spill, all generators must treat spilled hazardous wastes, clean-up residues and containers as hazardous wastes.

- All generators must use containers that are compatible with the hazardous waste they are to contain. Containers should be sealed and free from leakage.

- All generators of hazardous waste must ensure their wastes are delivered to an off-site facility that is authorized by EPA or the state in which the receiving facility is located to receive municipal, industrial, or hazardous waste. The type of facility depends on the category of the generator.

- All generators must ensure that off-site shipments of hazardous waste are labeled, marked, and placarded according the U.S. Department of Transportation (DOT) requirements. This includes a U.S. DOT waste description, shipping name, hazard class, and

identification number. Any questions about DOT shipping requirements can be referred to the Montana State Department of Transportation. [40 CFR 262.30 to 262.33]

- A Hazardous Waste Manifest is required when shipping hazardous wastes off-site. The standard form is the U.S. EPA manifest form 8700-22, which is processed by DHES. [ARM 16.44.405]

4.4 REQUIREMENTS FOR CONDITIONALLY EXEMPT GENERATORS

A business qualifies as a Conditionally Exempt Generator if no more than 100 kilograms (220 pounds) per month of hazardous waste and no more than 1 kilogram (2.2 pounds) per month of acutely hazardous waste are generated. Acutely hazardous wastes are listed in Table B-1 of Appendix B. No more than 1,000 kilograms (2,200 pounds) of hazardous waste can be accumulated on-site or on your property. There is no time limit for this accumulation, as long as the 1,000 kilogram storage limit is not exceeded.

As a rule of thumb, a 55-gallon drum of hazardous waste is about 200 kilograms (440 pounds). This means that the business must generate less than one-half of a 55-gallon drum of hazardous waste per month or accumulate no more than five 55-gallon drums at any one time.

As long as the above two conditions are maintained, a business falls into a category called "conditionally exempt". The business must still meet all of the requirements presented in Section 4.3 of this manual, but it is conditionally exempt from other requirements for generators of hazardous wastes.

Examples of how a business can lose conditionally exempt status are:

- The business generates less than 100 kilograms per month eleven months out of the year, and more than 100 kilograms in the twelfth month.
- The amount of hazardous waste accumulated by a business exceeds 1,000 kilograms.

If hazardous waste management practices result in a business losing its conditionally exempt status, all requirements for Small Generators must be met. These are listed in Section 4.5 of this manual.

As long as the business meets the requirements of this section, hazardous waste may be disposed at a hazardous waste facility, or a licensed Class II sanitary landfill or other facility approved by the State of Montana for industrial or municipal wastes on the condition that the operating authority of the landfill accepts the waste.

4.5 REQUIREMENTS FOR SMALL GENERATORS

Small generators are businesses generating between 100 and 1,000 kilograms (220 to 2,200 pounds) of hazardous waste per month. If a business falls in this category, it also may not generate more than 1 kilogram (2.2 pounds) per month of acutely hazardous waste (see Appendix B, Table B-1 and Section 3.3), and may not accumulate on-site more than 6,000 kilograms of hazardous waste. Businesses in this category must meet the following requirements:

Identification

- Small generators must have an EPA identification number. This twelve-digit number is part of a national data base to track hazardous waste activities for generators, transporters, disposal facilities, etc. In order to obtain an EPA identification number, contact the State of Montana Department of Health and Environmental Sciences and request a copy of EPA form 8700-12 "Notification of Hazardous Waste Activity". [40 CFR 262.12, ARM 16.44.403]

Accumulation Time Limit

- Storage of hazardous waste on the generator's property must not exceed 180 days, except if the waste must be transported greater than 200 miles, in which case the waste may be stored for up to 270 days. Hazardous waste may only be transported to authorized treatment, storage, or disposal facilities (TSDF). DHES can assist businesses with locating an authorized facility. This provision is designed to allow Small Generators to accumulate enough waste to justify making a shipment. [40 CFR 262.34 (e-f), ARM 16.44.415]

- Containers or drums must be labeled and dated on the first day that any hazardous waste is placed in them. From this date, each individual container may hold waste for a maximum of 180 days (or 270 days, depending on shipping distance) before it must be shipped to a TSDF. Wastes may not be transferred from one container to another to extend the allowable accumulation time. [40 CFR 262.34, ARM 16.44.415]

- Small Generators who reach the 6,000 kilogram (13,200 pounds) accumulation limit for total hazardous wastes on site must ship the waste to a TSDF in accordance with the rules in this section.

On-site Treatment

- Under certain circumstances, Small Generators may treat hazardous wastes on their property without a special permit only if the treatment takes place within the 180 day (or 270 day) time limit for storage and only if all container and tank storage requirements presented below are followed, and all necessary precautions taken to prevent spills or accidents. On-site treatment should be discussed with Montana DHES prior to commencement of operations to ensure that all applicable regulations have been followed.

On-site Disposal

- No Small Generator may dispose of hazardous wastes on their property without a Disposal Permit issued by EPA or DHES.

Shipment

- Small Generators must ship wastes to a hazardous waste TSDF. Wastes must be shipped using a manifest, and all manifest and waste analysis records must be maintained for at least three years. Care should be taken in selecting a waste hauler and a TSDF since the generator is still responsible for the proper management of the waste, even after it leaves his property. The generator should ensure that all hazardous waste haulers and TSDFs have EPA ID numbers. [40 CFR 262.40, 262.44, ARM 16.44.416]

Container Storage

If hazardous wastes are stored in containers (such as drums) the generator must:

- Clearly label each container with the words "Hazardous Waste" and the date on which waste storage begins in that container. Labels can be obtained from DHES.

- Make sure that hazardous waste is not stored in a container that will be corroded, ruptured, or damaged in any way by that waste. [40 CFR 265.172]

- Containers should be closed except when being filled or emptied. [40 CFR 265.173]

- Inspect containers weekly. Keep containers in good shape and replace any that are leaking. [40 CFR 265.174]

- Transfer hazardous waste from leaking containers to different containers. Label the new containers with the start date from the original container. [40 CFR 265.171]

- Never store wastes in the same container if they are non-compatible (reactive, explosive, etc.). [40 CFR 265.177]

- Containers of ignitable or reactive wastes must be stored as far as possible from the facility property line to ensure a buffer zone.

Tank Storage

If hazardous wastes are stored in tanks the generator must:
[40 CFR 265.201]

- Inspect tanks weekly and ensure that they are not leaking. Inspect monitoring or gauging systems each operating day.

- Make sure that hazardous waste is not stored in a tank that will be corroded, ruptured, or damaged in any way by that waste.

- Keep the tank covered or maintain at least two feet of freeboard (space at the top of the tank) in uncovered tanks.

- Provide a means to cut off or divert flow of waste into the tank in the event of a problem.

- Abide by National Fire Protection Association requirements for tanks containing ignitable or reactive wastes. These requirements specify the distances needed to establish safe buffer zones for various liquids based on combustible and flammable characteristics. The local fire department or DHES can assist with this.

Emergency Response

- At least one employee must be on hand or on call at all times in case of an emergency, and to be responsible for coordinating emergency response measures. This person is the emergency coordinator and he or his designee must respond to any emergencies.

- Small Generators must post the following information next to the telephone:

  - Name and telephone number of the emergency coordinator

  - Location of the fire extinguishers, spill control equipment, and fire alarm

  - Telephone number of the fire department, unless the facility is equipped with a direct alarm

- Small Generators must ensure that all employees are thoroughly familiar with the waste handling and emergency procedures relevant to their responsibilities.

- Emergencies that require a response include the following:

  - In the event of a fire, call the fire department or attempt extinguish the fire using a fire extinguisher

  - In the event of a spill, contain the flow of hazardous waste to the extent possible, and as soon as is practicable, clean up the hazardous waste and any contaminated materials or soil

- In the event of a fire, explosion, or other release that could threaten human health outside the facility or when the generator has knowledge that a spill has reached surface waters, the generator must immediately notify both the Montana DHES Hazardous Materials Spills Program (1-406-444-6911) and the National Response Center (1-800-424-8802). The report must include the following:

  - The generator's name, address, and EPA identification number

  - Date, time, and type of accident (e.g., spill, fire)

  - Quantity and type of hazardous waste involved in the incident

  - Extent of injuries, if any

  - Estimated quantity and disposition of recovered materials, if any

5.0 WASTE MANAGEMENT PLANS

This section of the manual provides waste management strategies currently available to those businesses involved in printing operations. Waste management strategies are focused on minimizing the amount of hazardous wastes that could be generated from these operations. There are several advantages of hazardous waste minimization including:

- Reducing the high costs associated with the management and disposal of hazardous wastes.
- Reducing the liability risks associated with the management and disposal of hazardous wastes.
- Reducing the problems arising from restrictions on land disposal of certain hazardous wastes.
- Minimizing the time and resources required to comply with the hazardous waste management regulations.

Waste minimization practices can include product substitution, process modifications, waste treatment, good housekeeping practices, and recycling and reuse. The selection of a particular waste minimization practice is based upon the industry or business operations, types of wastes generated, and their individual needs and problems.

Platemaking processes generate film and plate processing wastes, film negatives and transfer papers, etching wastes and wash waters, and used printing plates. Wastes generated from the printing processes included waste inks, wash waters from cleaning printing presses, waste newsprint, cleaning rags, and empty product containers. Section 3.0 described how some of these wastes could be hazardous wastes subject to RCRA and ARM regulation. Waste management practices for reducing the amount of these potentially hazardous wastes are described below. The practices described have been based upon methods currently used by the majority printing industries and are consistent with current RCRA and ARM regulations.

5.1 GENERAL WASTE MANAGEMENT PRACTICES FOR PROCESS WASTEWATERS

Process wastewaters generated from the platemaking and printing operations can all be managed using similar methods. These are described below.

Sanitary Sewer Discharges - The discharge of process wastewater to the sanitary sewer system is a commonly employed practice and widely acceptable method of waste disposal. As long as the process wastewaters are discharged to the sanitary sewer system along with domestic sewage, the wastewater is not subject to the RCRA and ARM hazardous waste regulations. This situation applies even if the wastewaters are classified as hazardous wastes. However, businesses intending to discharge process wastewaters to the sanitary sewer system should consult with DHES and local authorities to determine whether this exemption is applicable to the specific practices carried out at the facility.

In addition, that process wastewater discharges to the sanitary sewer system may be subject to local restrictions and limitations. In general, discharge limitations have been established for a number of wastewater parameters. Those wastewater parameters with possible discharge limitations that may apply to printing wastewaters are pH, temperature, and heavy metals. Wastewaters not meeting these discharge limits may require pretreatment for removal of the objectionable constituents. Businesses intending to discharge process wastewaters to the sanitary sewer system should check with their local municipality to determine what discharge restrictions or limitations apply and if a discharge permit is required.

Wastewater Segregation - In areas not serviced by a municipal sanitary sewer system and treatment facility, other wastewater management alternatives need to be considered, such as discharge to a septic system or a contracted waste pick-up and disposal services. For these alternative wastewater management practices, it is advisable to keep the potentially hazardous wastewaters segregated from the non-hazardous wastewaters. For example, some of the processing solutions used in film developing, such as the fixers and bleaches, may potentially be considered hazardous wastes. Mixing these wastewaters with non-hazardous wastewaters may result in a mixture that is also a hazardous waste. Keeping these wastewaters separated will reduce the total amount of hazardous waste generated and thus minimize the resources and problems associated with the management of a hazardous waste.

Septic System Discharges - Septic system discharges are a possible wastewater management alternative for film and platemaking processing wastes, however, these discharges depend upon regulatory approval. The generator must determine if his waste is a regulated hazardous waste, and if so, then discharge to a septic system is prohibited. Regulatory approval of these discharges will be based on wastewater characteristics, septic system design, and site-specific characteristics.

For this disposal method to be acceptable, the DHES requires that wastewater segregation is practiced. The non-hazardous process wastewaters may be discharged to the septic system. The hazardous process wastewaters must be collected and disposed in a manner consistent with the hazardous waste generator requirements as outlined in Section 4.0, such as a licensed offsite hazardous waste disposal facility.

Contracted Waste Disposal Services - In areas not serviced by a sanitary sewer system or in situations where septic tank discharges of process wastewaters are not an acceptable disposal method, contracted waste pick-up and disposal services may be utilized. Wastewater segregation is advised for this type of waste management option as contracted services that manage hazardous wastes are more expensive and harder to obtain than contract services that manage non-hazardous wastes. In addition, the regulations governing the management of hazardous wastes are more stringent than those for non-hazardous wastes, as described in Section 4.0.

5.2 FILM AND PLATE PROCESSING WASTES

Specific waste minimization practices for these types of wastes include replenishment of process chemicals and silver recovery. These methods are described below. Other wastewater management options, such as sanitary sewer discharge and wastewater segregation for onsite treatment or offsite disposal were discussed in Section 5.1.1.

Replenishment of Process Chemicals - Replenishment of process chemicals can be used for developing processes using sink lines and larger installations operated on a regular basis. This method involves adding new solutions to the partially used ones (replenishment), instead of disposing of an entire

volume of solution as it becomes ineffective for processing. The advantage of this method is that it greatly reduces the amount of solutions that must be disposed. Replenishment must be conducted with care in order to prevent the processing solutions from becoming too concentrated or too dilute. The replenishment instructions that come with the processing chemical should be followed.

Silver Recovery - The recovery of silver from processing wastewaters is a common waste management practice utilized by printing businesses. The advantages of silver recovery include reducing the silver concentration in the wastewater and the recovery of a valuable metal. Silver recovery can be used in situations where process wastewater discharges to the sanitary sewer system are subject to specific limitations for silver concentration. For waste disposal methods, other than sanitary sewer discharges, that are subject to the RCRA and ARM hazardous waste regulations, silver recovery from a wastewater reduces the toxicity of the waste and may render the waste non-hazardous.

Silver recovery methods include metallic replacement and electrolytic processes. Both types of silver recovery systems are commercially available from major manufacturers of film and plate processing chemicals. Metallic replacement methods utilize a cartridge containing steel wool or other type of iron media. As the wastewater containing silver is passed through the cartridge, the silver replaces the iron in the cartridge and the iron goes into the solution and passes out with the wastewater. The silver accumulating in the cartridge is periodically removed for recovery. In the electrolytic recovery process, the solution is passed through two electrodes operating on a direct current. Silver is deposited on the cathode (positive electrode) and stripped off periodically for recovery.

The silver recovered from these systems is collected and stored onsite until a sufficient quantity is obtained to warrant a shipment offsite to a facility that may reuse the silver. This collection and storage period can range from 6 months to 5 years, depending upon the characteristics and volume of wastewater being reclaimed for silver. Currently, there are no facilities in the state that collect and reuse the recovered silver. However, some of

the major manufacturers of film and plate processing chemicals, such as Kodak, will accept recovered silver from photo processing businesses and reuse it as a feedstock in film manufacturing. Another possible option for finding facilities that accept recovered silver is through the Montana Waste Exchange Program, operated by the Montana Chamber of Commerce. This program may locate a business or industry in the state that is interested in acquiring the recovered silver. Appendix C describes this program in greater detail.

5.3 WASTE INKS

The reclamation of waste inks is a feasible waste management alternative in consideration increasing land disposal restrictions for these wastes. Print shops and other small commercial printing business that do not generate significant quantities of waste ink may consider using a waste management service for offsite reclamation of the waste ink. Larger printing operations, such as newspapers, that generated large amounts of waste ink may consider onsite reclamation systems. Onsite reclamation systems are filtering systems that reclaim color and black inks and produce a usable black ink product. These onsite ink reclamation systems are in use today by many of the larger publication newspapers.

5.4 EMPTY CONTAINERS

Empty product containers should be returned to the vendor or distributor whenever possible. Some suppliers of ink products will collect and reuse the containers, such as Cal Ink in Spokane, Washington.

Containers that cannot be returned to the vendor or distributor may be disposed at a licensed Class II sanitary landfill. These containers, however, must be considered as empty as defined in Section 3.4.4. In some cases, the landfill authority may require that the containers be punctured or crushed prior to acceptance. Some cities or counties may have restrictions on the type, size, or number of containers that can be accepted.

5.5 NON-HAZARDOUS WASTES

Many of the non-hazardous wastes generated by printing operations, such as waste newsprint, film negatives and transfer papers, and printing plates, can be recycled. These recycling options are listed below.

Film Negatives and Transfer Papers - These materials may contain significant amounts of silver and can be processed to recover the silver. Many of the contract services that pick up reclaimed silver from onsite silver recovery systems will also collect film negatives and transfer papers.

Waste Newsprint - A substantial amount of this material can be generated from larger printing operations, such as newspapers. This material is also recyclable and many services are available to process and reclaim the waste newsprint.

Used Printing Plates - Some metal printing plates cannot be reused in the printing processes. In these cases, the metal plates can be recycled, such as in the case of aluminum plates.

Finding services or facilities that accept potentially recyclable materials can be difficult in some cases. To provide assistance in finding services or facilities that accept specific recyclable materials, the Montana Chamber of Commerce and State DHES have set up the Montana Waste Exchange Program. This program may locate a business or industry in the state that is interested in acquiring a specific recyclable material. Appendix C describes this program in greater detail.

Table A-1

LIST OF ACUTE HAZARDOUS WASTES
Source: 40 CFR 261.33(e)

Hazardous waste No.	Chemical Abstracts No.	Substance
P023	107-20-0	Acetaldehyde, chloro-
P002	591-08-2	Acetamide, N-(aminothioxomethyl)-
P057	640-19-7	Acetamide, 2-fluoro-
P058	62-74-8	Acetic acid, fluoro-, sodium salt
P066	16752-77-5	Acetimidic acid, N-[(methylcarbamoyl)oxy] thio-, methyl ester
P002	591-08-2	1-Acetyl-2-thiourea
P009	131-74-8	Ammonium picrate (R)
P119	7803-55-6	Ammonium vanadate
P010	7778-39-4	Arsenic acid
P012	1327-53-3	Arsenic oxide As_2
P011	1303-28-2	Arsenic oxide As_2O_5
P011	1303-28-2	Arsenic pentoxide
P012	1327-53-3	Arsenic trioxide
P038	692-42-2	Arsine, diethyl-
P036	696-28-6	Arsonous dichloride, phenyl-
P054	151-56-4	Aziridine
P013	542-62-1	Barium cyanide
P024	106-47-8	Benzenamine, 4-chloro-
P077	100-01-6	Benzenamine, 4-nitro-
P028	100-44-7	Benzene, (chloromethyl)-
P042	51-43-4	1,2-Benzenediol, 4-[1-hydroxy-2-(methyl-amino)ethyl]-, (R)
P046	122-09-8	Benzeneethanamine, alpha,alpha-dimethyl-
P014	108-98-5	Benzenethiol
P001	[1]81-81-2	2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, and salts
P028	100-44-7	Benzyl chloride
P015	7440-41-7	Beryllium dust
P016	542-88-1	Bis(chloromethyl) ether
P017	598-31-2	Bromoacetone
P018	357-57-3	Brucine
P021	592-01-8	Calcium cyanide
P022	75-15-0	Carbon bisulfide
P022	75-15-0	Carbon disulfide
P095	75-44-5	Carbonic dichloride
P023	107-20-0	Chloroacetaldehyde
P024	106-47-8	p-Chloroaniline
P029	544-92-3	Copper cyanide
P030	——	Cyanides (soluble cyanide salts), not otherwise specified
P031	460-19-5	Cyanogen
P033	506-77-4	Cyanogen chloride
P034	131-89-5	2-Cyclohexyl-4,6-dinitrophenol
P036	696-28-6	Dichlorophenylarsine
P037	60-57-1	Dieldrin
P038	692-42-2	Diethylarsine
P041	311-45-5	Diethyl-p-nitrophenyl phosphate
P040	297-97-2	O,O-Diethyl O-pyrazinyl phosphorothioate
P043	55-91-4	Diisopropyl fluorophosphate (DEP)
P004	309-00-2	1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha,4alpha,4abeta,5alpha, 8alpha,8abeta)-

Hazardous waste No.	Chemical Abstracts No.	Substance
P003	107-02-8	Acrolein
P070	116-06-3	Aldicarb
P004	309-00-2	Aldrin
P005	107-18-6	Allyl alcohol
P006	20859-73-8	Aluminum phosphide (R,T)
P007	2763-96-4	5-(Aminomethyl)-3-isoxazolol
P008	504-24-5	4-alpha-Aminopyridine
P046	122-09-8	alpha, alpha-Dimethylphenethylamine
P047	[1]534-52-1	4,6-Dinitro-o-cresol and salts
P048	51-28-5	2,4-Dinitrophenol
P020	88-85-7	Dinoseb
P085	152-16-9	Diphosphoramide, octamethyl-
P039	298-04-4	Disulfoton
P049	541-53-7	2,4-Dithiobiuret
P050	115-29-7	Endosulfan
P088	145-73-3	Endothal
P051	72-20-8	Endrin
P042	51-43-4	Epinephrine
P101	107-12-0	Ethyl cyanide
P054	151-56-4	Ethyleneimine
P097	52-85-7	Famphur
P056	7782-41-4	Fluorine
P057	640-19-7	Fluoroacetamide
P058	62-74-8	Fluoroacetic acid, sodium salt
P065	628-86-4	Fulminic acid, mercury(2+)salt (R,T)
P059	76-44-8	Heptachlor
P062	757-58-4	Hexaethyltetraphosphate
P116	79-19-6	Hydrazinecarbothioamide
P068	60-34-4	Hydrazine, methyl-
P063	74-90-8	Hydrocyanic acid
P063	74-90-8	Hydrogen cyanide
P096	7803-51-2	Hydrogen phosphide
P064	624-83-9	Isocyanic acid, methyl ester
P060	465-73-6	Isodrin
P007	2763-96-4	3(2H)-Isoxazolone, 5-(aminomethyl)-
P092	62-38-4	Mercury, (acetato-O)phenyl-
P065	628-86-4	Mercury fulminate (R,T)
P082	62-75-9	Methanamine, N-methyl-N-nitroso-
P016	542-88-1	Methane, oxybis(chloro-
P112	509-14-8	Methane, tetranitro- (R)
P118	75-70-7	Methanethiol, trichloro-
P050	115-29-7	6,9-Methano-2,4,3-benzodioxathiepen, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide
P059	76-44-8	4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-
P066	16752-77-5	Methomyl
P067	75-55-8	2-Methylaziridine
P068	60-34-4	Methyl hydrazine
P064	624-83-9	Methyl isocyanate
P069	75-86-5	2-Methyllactonitrile
P071	298-00-0	Methyl parathion
P072	86-88-4	alpha-Naphthylthiourea

Table A-1 (cont'd)

Hazardous waste No.	Chemical Abstracts No.	Substance
P060	465-73-6	1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha,4alpha,4abeta,5beta,8beta,8abeta)-
P037	60-57-1	2,7:3,6-Dimethanonaphth[2,3b]oxirane, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha,2beta,2aalpha,3beta,6beta,6aalpha,7beta,7aalpha)-
P051	72-20-8	2,7:3,6-Dimethanonaphth[2,3b]oxirane, octahydro-, (1aalpha,2beta,2abeta,3alpha,6alpha,6abeta,7beta,7aalpha)-
P044	60-51-5	Dimethoate
P045	39196-18-4	3,3-Dimethyl-1-(methylthio)-2-butanone, O-[(methylamino)carbonyl] oxime
P085	152-16-9	Octamethylpyrophosphoramide
P087	20816-12-0	Osmium oxide
P087	20816-12-0	Osmium tetroxide
P088	145-73-3	7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid
P089	56-38-2	Parathion
P034	131-89-5	Phenol, 2-cyclohexyl-4,6-dinitro-
P048	51-28-5	Phenol, 2,4-dinitro-
P047	[1]534-52-1	Phenol, 2-methyl-4,6-dinitro- and salts
P020	88-85-7	Phenol, 2-(1-methylpropyl)-4,6-dinitro-
P009	131-74-8	Phenol, 2,4,6-trinitro-, ammonium salt (R)
P092	62-38-4	Phenylmercury acetate
P093	103-85-5	Phenylthiourea
P094	298-02-2	Phorate
P095	75-44-5	Phosgene
P096	7803-51-2	Phosphine
P041	311-45-5	Phosphoric acid, diethyl 4-nitrophenyl ester
P039	298-04-4	Phosphorodithioic acid, O,O-diethyl S-[2-(ethylthio)ethyl] ester
P094	298-02-2	Phosphorodithioic acid, O,O-diethyl S-[(ethylthio)methyl] ester
P044	60-51-5	Phosphorodithioic acid, O,O-dimethyl S[2-(methylamino)-2-oxoethyl] ester
P043	55-91-4	Phosphorofluoridic acid, bis(1-methylethyl) ester
P089	56-38-2	Phosphorothioic acid, O,O-diethyl O-(p-nitrophenyl) ester
P040	297-97-2	Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester
P097	52-85-7	Phosphorothioic acid, O-[4-((dimethylamino)-sulfonyl)phenyl] O,O-dimethyl ester
P071	298-00-0	Phosphorothioic acid, O,O-dimethyl O-(4-nitrophenyl) ester
P110	78-00-2	Plumbane, tetraethyl-
P098	151-50-8	Potassium cyanide
P099	506-61-6	Potassium silver cyanide
P070	116-06-3	Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl]oxime
P101	107-12-0	Propanenitrile
P027	542-76-7	Propanenitrile, 3-chloro-
P069	75-86-5	Propanenitrile, 2-hydroxy-2-methyl-
P081	55-63-0	1,2,3-Propanetriol, trinitrate (R)
P017	598-31-2	2-Propanone, 1-bromo-
P102	107-19-7	Propargyl alcohol
P003	107-02-8	2-Propenal
P073	13463-39-3	Nickel carbonyl
P073	13463-39-3	Nickel carbonyl, (T-4)-
P075	[1]54-11-5	Nicotine and salts
P076	10102-43-9	Nitric oxide
P077	100-01-6	p-Nitroaniline
P078	10102-44-0	Nitrogen dioxide
P076	10102-43-9	Nitrogen oxide NO
P078	10102-44-0	Nitrogen oxide NO_2
P081	55-63-0	Nitroglycerine (R)
P082	62-75-9	N-Nitrosodimethylamine
P084	4549-40-0	N-Nitrosomethylvinylamine
P074	557-19-7	Nickel cyanide
P005	107-18-6	2-Propen-1-ol
P067	75-55-8	1,2-Propylenimine
P102	591-08-2	2-Propyn-1-ol
P008	504-24-5	Pyridinamine
P075	[1]54-11-5	Pyridine, (S)-3-(1-methyl-2-pyrrolidinyl)-, and salts
P111	107-49-3	Pyrophosphoric acid, tetraethyl ester
P103	630-10-4	Selenourea
P104	506-64-9	Silver cyanide
P105	26628-22-8	Sodium azide
P106	143-33-9	Sodium cyanide
P107	1314-96-1	Strontium sulfide
P108	[1]57-24-9	Strychnidin-10-one, and salts
P018	357-57-3	Strychnidin-10-one, 2,3-dimethoxy-
P108	[1]57-24-9	Strychnine and salts
P115	10031-59-1	Sulfuric acid, thallium(I) salt
P109	3689-24-5	Tetraethyldithiopyrophosphate
P110	78-00-2	Tetraethyl lead
P111	107-49-3	Tetraethylpyrophosphate
P112	509-14-8	Tetranitromethane (R)
P062	757-58-4	Tetraphosphoric acid, hexaethyl ester
P113	1314-32-5	Thallic oxide
P113	1314-32-5	Thallium(III) oxide
P114	12039-52-0	Thallium(I) selenide
P115	10031-59-1	Thallium(I) sulfate
P109	3689-24-5	Thiodiphosphoric acid, tetraethyl ester
P045	39196-18-4	Thiofanox
P049	541-53-7	Thioimidodicarbonic diamide
P014	108-98-5	Thiophenol
P116	79-19-6	Thiosemicarbazide
P026	5344-82-1	Thiourea, (2-chlorophenyl)-
P072	86-88-4	Thiourea, 1-naphthalenyl-
P093	103-85-5	Thiourea, phenyl-
P123	8001-35-2	Toxaphene
P118	75-70-7	Trichloromethanethiol
P119	7803-55-6	Vanadic acid, ammonium salt
P120	1314-62-1	Vanadium(V) oxide
P084	4549-40-0	Vinylamine, N-methyl-N-nitroso-
P001	81-81-2	Warfarin
P121	557-21-1	Zinc cyanide
P122	1314-84-7	Zinc phosphide (R,T)

[1]CAS Number given for parent compound only.

Table A-1 (cont'd)

Industry and EPA hazardous waste No.	Hazardous waste	Hazard code
F020	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri- or tetrachlorophenol, or of intermediates used to produce their pesticide derivatives. (This listing does not include wastes from the production of Hexachlorophene from highly purified 2,4,5-trichlorophenol.).	(H)
F021	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of pentachlorophenol, or of intermediates used to produce its derivatives.	(H)
F022	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetra- , penta-, or hexachlorobenzenes under alkaline conditions.	(H)
F023	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri- and tetrachlorophenols. (This listing does not include wastes from equipment used only for the production or use of Hexachlorophene from highly purified 2,4,5-trichlorophenol.).	(H)
F026	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetra-, penta-, or hexachlorobenzene under alkaline conditions.	(H)
F027	Discarded unused formulations containing tri-, tetra-, or pentachlorophenol or discarded unused formulations containing compounds derived from these chlorophenols. (This listing does not include formulations containing Hexachlorophene sythesized from prepunfied 2,4,5-trichlorophenol as the sole component.).	(H)

Table A-2

LIST OF TOXIC WASTES
Source: 40 CFR 261.33(f)

Hazardous waste No.	Chemical Abstracts No.	Substance
U001	75-07-0	Acetaldehyde (I)
U034	75-87-6	Acetaldehyde, trichloro-
U187	62-44-2	Acetamide, N-(4-ethoxyphenyl)-
U005	53-96-3	Acetamide, N-9H-fluoren-2-yl-
U112	141-78-6	Acetic acid, ethyl ester (I)
U144	301-04-2	Acetic acid, lead salt
U214	563-68-8	Acetic acid, thallium (1+) salt
U232	93-76-5	Acetic acid, (2,4,5,-trichlorophenoxy)-
U002	67-64-1	Acetone (I)
U003	75-05-8	Acetonitrile (I,T)
U004	98-86-2	Acetophenone
U005	53-96-3	2-Acetylaminofluorene
U006	75-36-5	Acetyl chloride (C,R,T)
U007	79-06-1	Acrylamide
U008	79-10-7	Acrylic acid(I)
U009	107-13-1	Acrylonitrile
U011	61-82-5	Amitrole
U012	62-53-3	Aniline (I,T)
U014	492-80-8	Auramine
U015	115-02-6	Azaserine
U010	50-07-7	Azirino(2',3':3,4)pyrrolo(1,2-a]indole-4,7-dione,6-amino-8-[((aminocarbonyl)oxy) methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-
U157	50-49-5	Benz[j]acesanthrylene, 1,2-dihydro-3-methyl-
U016	225-51-4	3,4-Benzacridine
U017	98-87-3	Benzal chloride
U192	23950-58-5	Benzamide, 3,5-dichloro-N-(1,1-diethyl-2-propynyl)-
U018	56-55-3	Benz[a]anthracene
U094	57-97-6	Benz[a]anthracene, 7,12-dimethyl-
U012	62-53-3	Benzenamine (I,T)
U014	492-80-8	Benzenamine, 4,4'-carbonimidoylbis[N,N-dimethyl-
U049	3165-93-3	Benzenamine, 4-chloro-2-methyl-
U093	60-11-7	Benzenamine, N,N-dimethyl-4-(phenylazo)-
U328	95-53-4	Benzenamine, 2-methyl-
U353	106-49-0	Benzenamine, 4-methyl-
U158	101-14-4	Benzenamine, 4,4'-methylenebis[2-chloro-
U222	636-21-5	Benzenamine, 2-methyl-, hydrochloride
U181	99-55-8	Benzenamine, 2-methyl-5-nitro-
U019	71-43-2	Benzene
U038	510-15-6	Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy, ethyl ester
U030	101-55-3	Benzene, 1-bromo-4-phenoxy-
U035	305-03-3	Benzenebutanoic acid, 4-[bis(2-chloroethyl)amino]-
U037	108-90-7	Benzene, chloro-
U221	25376-45-8	Benzenediamine, ar-methyl-
U028	117-81-7	1,2-Benzenedicarboxylic acid, [bis(2-ethylhexyl)] ester
U069	84-74-2	1,2-Benzenedicarboxylic acid, dibutyl ester
U088	84-66-2	1,2-Benzenedicarboxylic acid, diethyl ester
U102	131-11-3	1,2-Benzenedicarboxylic acid, dimethyl ester
U107	117-84-0	1,2-Benzenedicarboxylic acid, di-n-octyl ester
U070	95-50-1	Benzene, 1,2-dichloro-
U071	541-73-1	Benzene, 1,3-dichloro-
U072	106-46-7	Benzene, 1,4-dichloro-
U060	72-54-8	Benzene, 1,1'-(2,2-dichloro-ethylidene) bis[4-chloro-
U017	98-87-3	Benzene, (dichloromethyl)-
U223	26471-62-5	Benzene, 1,3-diisocyanatomethyl- (R,T)
U239	1330-20-7	Benzene, dimethyl- (I,T)
U201	108-46-3	1,3-Benzenediol
U127	118-74-1	Benzene, hexachloro-
U056	110-82-7	Benzene, hexahydro- (I)
U220	108-88-3	Benzene, methyl-
U105	121-14-2	Benzene, 1-methyl-2,4-dinitro-
U106	606-20-2	Benzene, 2-methyl-1,3-dinitro-
U055	98-82-8	Benzene, (1-methylethyl)- (I)
U169	98-95-3	Benzene, nitro- (I,T)
U183	608-93-5	Benzene, pentachloro-
U185	82-68-8	Benzene, pentachloronitro-
U020	98-09-9	Benzenesulfonic acid chloride (C,R)
U020	98-09-9	Benzenesulfonyl chloride (C,R)
U207	95-94-3	Benzene, 1,2,4,5-tetrachloro-
U061	50-29-3	Benzene, 1,1'-(2,2,2-trichloroethylidene)bis(4-chloro-
U247	72-43-5	Benzene, 1,1'-(2,2,2-trichloroethylidene)[4-methoxy-
U023	98-07-7	Benzene, (trichloromethyl)- (C,R,T)
U234	99-35-4	Benzene, 1,3,5-trinitro- (R,T)
U021	92-87-5	Benzidine
U202	[1]81-07-2	1,2-Benzisothiazol-3-(2H)-one,1,1-dioxide and salts
U203	94-59-7	1,3-Benzodioxole, 5-(2-propenyl)-
U141	120-58-1	1,3-Benzodioxole, 5-(1-propenyl)-
U090	94-58-6	1,3-Benzodioxole, 5-propyl-
U064	189-55-9	Benzo[rst] pentaphene
U022	50-32-8	Benzo[a]pyrene
U197	106-51-4	p-Benzoquinone
U023	98-07-7	Benzotrichloride (C,R,T)
U085	1464-53-5	2,2'-Bioxirane (I,T)
U021	92-87-5	[1,1'-Biphenyl]-4,4'-diamine
U073	91-94-1	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dichloro-
U091	119-90-4	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethoxy-
U095	119-93-7	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethyl-
U027	39638-32-9	Bis(2-chloroisopropyl) ether
U024	111-91-1	Bis(2-chloromethoxy) ethane
U028	117-81-7	Bis(2-ethylhexyl) phthalate
U225	75-25-2	Bromoform
U030	101-55-3	4-Bromophenyl phenyl ether
U128	87-68-3	1,3-Butadiene, 1,1,2,3,4,4-hexachloro-
U172	924-16-3	1-Butanamine, N-butyl-N-nitroso-
U031	71-36-3	1-Butanol (I)
U159	78-93-3	2-Butanone (I,T)
U160	1338-23-4	2-Butanone peroxide (R,T)
U053	4170-30-3	2-Butenal
U074	764-41-0	2-Butene, 1,4-dichloro- (I,T)

Table A-2 (cont'd)

Hazardous waste No.	Chemical Abstracts No.	Substance
U143	303-34-4	2-Butenoic acid, 2-methyl-, 7-[(2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy)methyl]-2,3,5,7a-tetrahydro-1-pyrrolizin-1-yl ester, [1S-[1alpha(Z),7(2S,3R),7aalpha]]-
U031	71-36-3	n-Butyl alchohol (I)
U136	75-60-5	Cacodylic acid
U032	13765-19-0	Calcium chromate
U238	51-79-6	Carbamic acid, ethyl ester
U178	615-53-2	Carbamic acid, methylnitroso-, ethyl ester
U097	79-44-7	Carbamic chloride, dimethyl-
U114	[1]111-54-6	Carbamodithioic acid, 1,2-ethanediylbis-, salts and esters
U062	2303-16-4	Carbamothioic acid, bis(1-methylethyl)-S-(2,3-dichloro-2-propenyl) ester
U215	6533-73-9	Carbonic acid, dithallium(1+) salt
U033	353-50-4	Carbonic difluoride
U156	79-22-1	Carbonochloridic acid, methyl ester (I,T)
U033	353-50-4	Carbon oxyfluoride (R,T)
U211	56-23-5	Carbon tetrachloride
U034	75-87-6	Chloral
U035	305-03-3	Chlorambucil
U036	12789-03-6	Chlordane
U026	494-03-1	Chlornaphazine
U037	108-90-7	Chlorobenzene
U039	59-50-7	p-Chloro-m-cresol
U041	106-89-8	1-Chloro-2,3-epoxypropane
U042	110-75-8	2-Chloroethyl vinyl ether
U044	67-66-3	Chloroform
U046	107-30-2	Chloromethyl methyl ether
U047	91-58-7	beta-Chloronaphthalene
U048	95-57-8	o-Chlorophenol
U049	3165-93-3	4-Chloro-o-toluidine, hydrochloride
U032	13765-19-0	Chromic acid, calcium salt
U050	218-01-9	Chrysene
U051	8021-39-4	Creosote
U052	1319-77-3	Cresols (Cresylic acid)
U053	4170-30-3	Crotonaldehyde
U055	98-82-8	Cumene (I)
U246	506-68-3	Cyanogen bromide
U197	106-51-4	2,5-Cyclohexadiene-1,4-dione
U056	110-82-7	Cyclohexane (I)
U057	108-94-1	Cyclohexanone (I)
U130	77-47-4	1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-
U058	50-18-0	Cyclophosphamide
U240	[1]94-75-7	2,4-D, salts and esters
U059	20830-81-3	Daunomycin
U060	72-54-8	DDD
U061	50-29-3	DDT
U062	2303-16-4	Diallate
U063	53-70-3	Dibenz[a,h]anthracene
U064	189-55-9	Dibenzo[a,i]pyrene
U066	96-12-8	1,2-Dibromo-3-chloropropane
U069	84-74-2	Dibutyl phthalate
U070	95-50-1	o-Dichlorobenzene
U071	541-73-1	m-Dichlorobenzene
U072	106-46-7	p-Dichlorobenzene
U073	91-94-1	3,3'-Dichlorobenzidine
U074	764-41-0	1,4-Dichloro-2-butene (I,T)

Hazardous waste No.	Chemical Abstracts No.	Substance
U075	75-71-8	Dichlorodifluoromethane
U078	75-35-4	1,1-Dichloroethylene
U079	156-60-5	1,2-Dichloroethylene
U025	111-44-1	Dichloroethyl ether
U081	120-83-2	2,4-Dichlorophenol
U082	87-65-0	2,6-Dichlorophenol
U240	[1]94-75-7	2,4-Dichlorophenoxyacetic acid, salts and esters
U083	78-87-5	1,2-Dichloropropane
U084	542-75-6	1,3-Dichloropropene
U085	1464-53-5	1,2:3,4-Diepoxybutane (I,T)
U108	123-91-1	1,4-Diethyleneoxide
U086	1615-80-1	N,N-Diethylhydrazine
U087	3288-58-2	O,O-Diethyl-S-methyl-dithiophosphate
U088	84-66-2	Diethyl phthalate
U089	56-53-1	Diethylstilbestrol
U090	94-58-6	Dihydrosafrole
U091	119-90-4	3,3'-Dimethoxybenzidine
U092	124-40-3	Dimethylamine (I)
U093	60-11-7	Dimethylaminoazobenzene
U094	57-97-6	7,12-Dimethylbenz[a]anthracene
U095	119-93-7	3,3'-Dimethylbenzidine
U096	80-15-9	alpha,alpha-Dimethylbenzylhydroperoxide (R)
U097	79-44-7	Dimethylcarbamoyl chloride
U098	57-14-7	1,1-Dimethylhydrazine
U099	540-73-8	1,2-Dimethylhydrazine
U101	105-67-9	2,4-Dimethylphenol
U102	131-11-3	Dimethyl phthalate
U103	77-78-1	Dimethyl sulfate
U105	121-14-2	2,4-Dinitrotoluene
U106	606-20-2	2,6-Dinitrotoluene
U107	117-84-0	Di-n-octyl phthalate
U108	123-91-1	1,4-Dioxane
U109	122-66-7	1,2-Diphenylhydrazine
U110	142-84-7	Dipropylamine (I)
U111	621-64-7	Di-n-propylnitrosamine
U001	75-07-0	Ethanal (I)
U174	55-18-5	Ethanamine, N-ethyl-N-nitroso-
U155	91-80-5	1,2-Ethanediamine, N,N-dimethyl-N'-2-pyridinyl-N'-(2-thienylmethyl)-
U067	106-93-4	Ethane, 1,2-dibromo-
U076	75-34-3	Ethane, 1,1-dichloro-
U077	107-06-2	Ethane, 1,2-dichloro-
U131	67-72-1	Ethane, hexachloro-
U024	111-91-1	Ethane, 1,1'-[methylenebis(oxy)]bis[2-chloro-
U117	60-29-7	Ethane, 1,1-oxybis- (I)
U025	111-44-4	Ethane, 1,1'-oxybis[2-chloro-
U184	76-01-7	Ethane, pentachloro-
U208	630-20-6	Ethane, 1,1,1,2-tetrachloro-
U209	79-34-5	Ethane, 1,1,2,2-tetrachloro-
U218	62-55-5	Ethanethioamide
U227	110-80-5	Ethanol, 2-ethoxy
U359	79-00-5	Ethane, 1,1,2-trichloro-
U173	1116-54-7	Ethanol, 2,2'-(nitrosoimino)bis-
U004	98-86-2	Ethanone, 1-phenyl-
U043	75-01-4	Ethene, chloro-
U042	110-75-8	Ethene, (2-chloroethoxy)-

Table A-2 (cont'd)

Hazardous waste No.	Chemical Abstracts No.	Substance
U166	130-15-4	1,4-Naphthoquinone
U167	134-32-7	alpha-Naphthylamine
U168	91-59-8	beta-Naphthylamine
U026	494-03-1	2-Naphthylamine, N,N'-bis(2-chloroethyl)-
U167	134-32-7	1-Naphthylenamine
U168	91-59-8	2-Naphthylenamine
U217	10102-45-1	Nitric acid, thallium(1+) salt
U169	98-95-3	Nitrobenzene (I,T)
U170	100-02-7	p-Nitrophenol
U171	79-46-9	2-Nitropropane (I,T)
U172	924-16-3	N-Nitrosodi-n-butylamine
U173	1116-54-7	N-Nitrosodiethanolamine
U174	55-18-5	N-Nitrosodiethylamine
U176	759-73-9	N-Nitroso-N-ethylurea
U177	684-93-5	N-Nitroso-N-methylurea
U178	615-53-2	N-Nitroso-N-methylurethane
U179	100-75-4	N-Nitrosopiperidine
U180	930-55-2	N-Nitrosopyrrolidine
U181	99-55-8	5-Nitro-o-toluidine
U193	1120-71-4	1,2-Oxathiolane, 2,2-dioxide
U058	50-18-0	2H-1,3,2-Oxazaphosphorin-2-amine, N,N-bis(2-chloroethyl)tetrahydro-, 2-oxide
U115	75-21-8	Oxirane (I,T)
U126	765-34-4	Oxiranecarboxyaldehyde
U041	106-89-8	Oxirane, (chloromethyl)-
U182	123-63-7	Paraldehyde
U183	608-93-5	Pentachlorobenzene
U184	76-01-7	Pentachloroethane
U185	82-68-8	Pentachloronitrobenzene (PCNB)
U242	87-86-5	Pentachlorophenol
U186	504-60-9	1,3-Pentadiene (I)
U187	62-44-2	Phenacetin
U188	108-95-2	Phenol
U048	95-57-8	Phenol, 2-chloro-
U039	59-50-7	Phenol, 4-chloro-3-methyl-
U081	120-83-2	Phenol, 2,4-dichloro-
U082	87-65-0	Phenol, 2,6-dichloro-
U089	56-53-1	Phenol, 4,4'-(1,2-diethyl-1,2-ethenediyl)bis-,(E)-
U101	105-67-9	Phenol, 2,4-dimethyl-
U052	1319-77-3	Phenol, methyl-
U132	70-30-4	Phenol, 2,2'-methylenebis[3,4,6-trichloro-
U170	100-02-7	Phenol, 4-nitro-
* U242	87-86-5	Phenol, pentachloro-
* U212	58-90-2	Phenol, 2,3,4,6-tetrachloro-
* U230	95-94-4	Phenol, 2,4,5-trichloro-
U231	88-06-2	Phenol, 2,4,6-trichloro-
U150	148-82-3	L-Phenylalanine, 4-[bis(2-chloroethyl) amino]-
U145	7446-27-7	Phosphoric acid, lead salt
U087	3288-58-2	Phosphorodithioic acid, O,O-diethyl-, S-methyl ester
U189	108-95-2	Phosphorus sulfide (R)
U190	85-44-9	Phthalic anhydride
U191	109-06-8	2-Picoline
U179	100-75-4	Piperidine, 1-nitroso-
U192	23950-58-5	Pronamide
U194	107-10-8	1-Propanamine (I,T)
U111	621-64-7	1-Propanamine, N-nitroso-N-propyl-
U110	142-84-7	1-Propanamine, N-propyl- (I)

Hazardous waste No.	Chemical Abstracts No.	Substance
U066	96-12-8	Propane, 1,2-dibromo-3-chloro-
U149	109-77-3	Propanedinitrile
U171	79-46-9	Propane, 2-nitro- (I,T)
U027	39638-32-9	Propane, 2,2'-oxybis[2-chloro-
U193	1120-71-4	1,3-Propane sultone
U235	126-72-7	1-Propanol, 2,3-dibromo-, phosphate (3:1)
U140	78-83-1	1-Propanol, 2-methyl- (I,T)
U002	67-64-1	2-Propanone (I)
U084	542-75-6	1-Propene, 1,3-dichloro-
U152	126-98-7	2-Propenenitrile, 2-methyl- (I,T)
U007	79-06-1	2-Propenamide
U243	1888-71-7	1-Propene, hexachloro-
U009	107-13-1	2-Propenenitrile
U008	79-10-7	2-Propenoic acid (I)
U113	140-88-5	2-Propenoic acid, ethyl ester (I)
U118	97-63-2	2-Propenoic acid, 2-methyl-, ethyl ester
U162	80-62-6	2-Propenoic acid, 2-methyl-, methyl ester (I,T)
*U233	93-72-1	Propionic acid, 2-(2,4,5-trichlorophenoxy)-
U194	107-10-8	n-Propylamine (I,T)
U083	78-87-5	Propylene dichloride
U148	123-33-1	3,6-Pyridazinedione, 1,2-dihydro
U196	110-86-1	Pyridine
U191	109-06-8	Pyridine, 2-methyl-
U237	66-75-1	2,4(1H,3H)-Pyrimidinedione, 5-[bis(2-chloroethyl)amino]-
U164	56-04-2	4-(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-
U180	930-55-2	Pyrrolidine, 1-nitroso-
U200	50-55-5	Reserpine
U201	108-46-3	Resorcinol
U202	81-07-2	Saccharin and salts
U203	94-59-7	Safrole
U204	7783-00-8	Selenious acid
U204	7783-00-8	Selenium dioxide
U205	7446-34-6	Selenium sulfide (R,T)
U015	115-02-6	L-Serine, diazoacetate (ester)
* U233	93-72-1	Silvex
U206	18883-66-4	Streptozotocin
U103	77-78-1	Sulfuric acid, dimethyl ester
U189	1314-80-3	Sulfur phosphide (R)
*U232	93-76-5	2,4,5-T
U207	95-94-3	1,2,4,5-Tetrachlorobenzene
U208	630-20-6	1,1,1,2-Tetrachloroethane
U209	79-34-5	1,1,2,2-Tetrachloroethane
U210	127-18-4	Tetrachloroethylene
* U212	58-90-2	2,3,4,6-Tetrachlorophenol
U213	109-99-9	Tetrahydrofuran (I)
U214	15843-14-8	Thallium(I) acetate
U215	6533-73-9	Thallium(I) carbonate
U216	7791-12-0	Thallium chloride
U217	10102-45-1	Thallium(I) nitrate
U218	62-55-5	Thioacetamide
U153	74-93-1	Thiomethanol (I,T)
U244	137-26-8	Thioperoxydicarbonic diamide, tetramethyl-
U219	62-56-6	Thiourea
U244	137-26-8	Thiuram
U220	108-88-3	Toluene
U221	25376-45-8	Toluenediamine
U223	26471-62-5	Toluene diisocyanate (R,T)

Table A-2 (cont'd)

Hazardous waste No.	Chemical Abstracts No.	Substance
U078	75-35-4	Ethene, 1,1-dichloro-
U079	156-60-5	Ethene, 1,2-dichloro-, (E)-
U210	127-18-4	Ethene, tetrachloro-
U228	79-01-6	Ethene, trichloro
U112	141-78-6	Ethyl acetate (I)
U113	140-88-5	Ethyl acrylate (I)
U238	51-79-6	Ethyl carbamate
U038	510-15-6	Ethyl 4,4'-dichlorobenzilate
U114	111-54-6	Ethylenebis(dithiocarbamic acid), salts and esters
U067	106-93-4	Etylene dibromide
U077	107-06-2	Ethylene dichloride
U359	110-80-5	Ethylene glycol monoethyl ether
U115	75-21-8	Ethylene oxide (I,T)
U116	96-45-7	Ethylene thiourea
U117	60-29-7	Ethyl ether (I)
U076	75-34-3	Ethylidene dichloride
U118	97-63-2	Ethyl methacrylate
U119	62-50-0	Ethylmethanesulfonate
U120	206-44-0	Fluoranthene
U122	50-00-0	Formaldehyde
U123	64-18-6	Formic acid (C,T)
U124	110-00-9	Furan (I)
U125	98-01-1	2-Furancarboxaldehyde (I)
U147	108-31-6	2,5-Furandione
U213	109-99-9	Furan, tetrahydro- (I)
U125	98-01-1	Furfural (I)
U124	110-00-9	Furfuran (I)
U206	18883-66-4	D-Glucopyranose, 2-deoxy-2(3-methyl-3-nitrosoureido)-
U126	765-34-4	Glycidylaldehyde
U163	70-25-7	Guanidine, N-methyl-N'-nitro-N-nitroso-
U127	18-74-1	Hexachlorobenzene
U128	87-68-3	Hexachlorobutadiene
U129	58-88-9	Hexachlorocyclohexane (gamma isomer)
U130	77-47-4	Hexachlorocyclopentadiene
U131	67-72-1	Hexachloroethane
U132	70-30-4	Hexachlorophene
U243	1888-71-7	Hexachloropropene
U133	302-01-2	Hydrazine (R,T)
U086	1615-80-1	Hydrazine, 1,2-diethyl-
U098	57-14-7	Hydrazine, 1,1-dimethyl-
U099	540-73-8	Hydrazine, 1,2-dimethyl-
U109	122-66-7	Hydrazine, 1,2-diphenyl-
U134	7664-39-3	Hydrofluoric acid (C,T)
U134	7664-39-3	Hydrogen fluoride (C,T)
U135	7783-06-4	Hydrogen sulfide
U096	80-15-9	Hydroperoxide, 1-methyl-1-phenylethyl- (R)
U136	75-60-5	Hydroxydimethylarsine oxide
U116	96-45-7	2-Imidazolidinethione
U137	193-39-5	Indeno[1,2,3-cd]pyrene
U139	9004-66-4	Iron dextran
U190	85-44-9	1,3-Isobenzofurandione
U140	78-83-1	Isobutyl alcohol (I,T)
U141	120-58-1	Isosafrole
U142	143-50-0	Kepone
U143	303-34-4	Lasiocarpine
U144	301-04-2	Lead acetate
U146	1335-32-6	Lead, bis(acetato-O)tetrahydroxytri-
U145	7446-27-7	Lead phosphate
U146	1335-32-6	Lead subacetate
U129	58-89-9	Lindane
U147	108-31-6	Maleic anhydride
U148	123-33-1	Maleic hydrazide
U149	109-77-3	Malononitrile
U150	148-82-3	Melphalan
U151	7439-97-6	Mercury
U152	126-98-7	Methacrylonitrile (I,T)
U092	124-40-3	Methanamine, N-methyl- (I)
U029	74-83-9	Methane, bromo-
U045	74-87-3	Methane, chloro-(I,T)
U046	107-30-2	Methane, chloromethoxy-
U068	74-95-3	Methane, dibromo-
U080	75-09-2	Methane, dichloro-
U075	75-71-8	Methane, dichlorodifluoro-
U138	74-88-4	Methane, iodo-
U119	62-50-0	Methanesulfonic acid, ethyl ester
U211	56-23-5	Methane, tetrachloro-
U153	74-93-1	Methanethiol (I,T)
U225	75-25-2	Methane, tribromo-
U044	67-66-3	Methane, trichloro-
U121	75-69-4	Methane, trichlorofluoro-
U123	64-18-6	Methanoic acid (C,T)
U154	67-56-1	Methanol (I)
U155	91-80-5	Methapyrilene
U142	143-50-0	1,3,4-Metheno-2H-cyclobuta[cd]pentalen-2-one,1,1a,3,3a,4,5,5,5a,5b,6-decachloro-octahydro-
U247	72-43-5	Methoxychlor
U154	67-56-1	Methyl alcohol (I)
U029	74-83-9	Methyl bromide
U186	504-60-9	1-Methylbutadiene (I)
U045	74-87-3	Methyl chloride (I,T)
U156	79-22-1	Methylchlorocarbonate (I,T)
U226	71-55-6	Methylchloroform
U157	56-49-5	3-Methylcholanthrene
U158	101-14-4	4,4'-Methylenebis(2-chloroaniline)
U068	74-95-3	Methylene bromide
U080	75-09-2	Methylene chloride
U159	78-93-3	Methyl ethyl ketone (MEK)(I,T)
U160	1338-23-4	Methyl ethyl ketone peroxide (R,T)
U138	74-88-4	Methyl iodide
U161	108-10-1	Methyl isobutyl ketone (I)
U162	80-62-6	Methyl methacrylate (I,T)
U163	70-25-7	N-Methyl-N'-nitro-N-nitrosoguanidine
U161	108-10-1	4-Methyl-2-pentanone (I)
U164	56-04-2	Methylthiouracil
U010	50-07-7	Mitomycin C
U059	20830-81-3	5,12-Naphthacenedione, (8S-cis)-8-acetyl-10-[(3-amino-2,3,6-trideoxy-alpha-L-lyxo-hexopyranosyl)oxy]-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-
U165	91-20-3	Naphthalene
U047	91-58-7	Naphthalene, 2-chloro-
U166	130-15-4	1,4-Naphthalenedione
U236	72-57-1	2,7-Naphthalenedisulfonic acid, 3,3'-[(3,3'-dimethyl-(1,1'-biphenyl)-4,4'diyl)]-bis (azo) bis(5-amino-4-hydroxy)-, tetrasodium salt

Table A-2 (cont'd)

Hazardous waste No.	Chemical Abstracts No.	Substance
U328	95-53-4	o-Toluidine
U353	106-49-0	p-Toluidine
U222	636-21-5	o-Toluidine hydrochloride
U011	61-82-5	1H-1,2,4-Triazol-3-amine
U226	71-55-6	1,1,1-Trichloroethane
U227	79-00-5	1,1,2-Trichloroethane
U228	79-01-6	Trichloroethylene
U121	75-69-4	Trichloromonofluoromethane
* U230	95-95-4	2,4,5-Trichlorophenol
* U231	88-06-2	2,4,6-Trichlorophenol
U234	99-35-4	sym-Trinitrobenzene (R,T)
U182	123-63-7	1,3,5-Trioxane, 2,4,6-trimethyl-
U235	126-72-7	Tris(2,3-dibromopropyl) phosphate
U236	72-57-1	Trypan blue
U237	66-75-1	Uracil mustard
U176	759-73-9	Urea, N-ethyl-N-nitroso-
U177	684-93-5	Urea, N-methyl-N-nitroso-
U043	75-01-4	Vinyl chloride
U248	81-81-2	Warfarin, when present at concentrations of 0.3% or less
U239	1330-20-7	Xylene (I)
U200	50-55-5	Yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[(3,4,5-trimethoxybenzoyl) oxy]-, methyl ester
U249	1314-84-7	Zinc phosphide, when present at concentrations of 10% or less.

[1]CAS Number given for parent compound only.

* These wastes are also designated as F027 wastes. See Table A-1.

Table A-2 (cont'd)

Industry and EPA hazardous waste No.	Hazardous waste	Hazard code
Generic:		
F001	The following spent halogenated solvents used in degreasing: Tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons; all spent solvent mixtures/blends used in degreasing containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(T)
F002	The following spent halogenated solvents: Tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane, and 1,1,2-trichloroethane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those listed in F001, F004, or F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(T)
F003	The following spent non-halogenated solvents: Xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol; all spent solvent mixtures/blends containing, before use, only the above spent non-halogenated solvents; and all spent solvent mixtures/blends containing, before use, one or more of the above non-halogenated solvents, and, a total of ten percent or more (by volume) of one or more of those solvents listed in F001, F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(I)*
F004	The following spent non-halogenated solvents: Cresols and cresylic acid, and nitrobenzene; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(T)
F005	The following spent non-halogenated solvents: Toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, benzene, 2-ethoxyethanol, and 2-nitropropane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, or F004; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(I,T)
F006	Wastewater treatment sludges from electroplating operations except from the following processes: (1) Sulfuric acid anodizing of aluminum; (2) tin plating on carbon steel; (3) zinc plating (segregated basis) on carbon steel; (4) aluminum or zinc-aluminum plating on carbon steel; (5) cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel; and (6) chemical etching and milling of aluminum.	(T)
F019	Wastewater treatment sludges from the chemical conversion coating of aluminum.	(T)
F007	Spent cyanide plating bath solutions from electroplating operations.	(R, T)
F008	Plating bath residues from the bottom of plating baths from electroplating operations where cyanides are used in the process.	(R, T)
F009	Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process.	(R, T)
F010	Quenching bath residues from oil baths from metal heat treating operations where cyanides are used in the process.	(R, T)
F011	Spent cyanide solutions from salt bath pot cleaning from metal heat treating operations.	(R, T)
F012	Quenching waste water treatment sludges from metal heat treating operations where cyanides are used in the process.	(T)
F024	Wastes, including but not limited to, distillation residues, heavy ends, tars, and reactor clean-out wastes from the production of chlorinated aliphatic hydrocarbons, having carbon content from one to five, utilizing free radical catalyzed processes. [This listing does not include light ends, spent filters and filter aids, spent desiccants, wastewater, wastewater treatment sludges, spent catalysts, and wastes listed in Section 261.32.].	(T)
F028	Residues resulting from the incineration or thermal treatment of soil contaminated with EPA Hazardous Waste Nos. F020, F021, F022, F023, F026, and F027.	(T)

APPENDIX B

IDENTIFYING RCRA CHARACTERISTIC HAZARDOUS WASTES

EPA has identified four characteristics which cause a waste to be regulated as a hazardous waste: ignitable, corrosive, reactive, and extraction procedure (EP) toxic. For each characteristic, EPA has developed approved methods for determining whether a waste is hazardous. A brief description of each characteristic and applicable tests follows. The specific definitions of these characteristics are specified in 40 CFR 261, Subpart C.

CHARACTERISTIC OF IGNITABILITY:

A waste exhibits the characteristic of ignitability if a representative sample of the waste is easily combustible or flammable. Examples of these ignitable wastes include paint wastes, certain degreasers, and solvents. The specific characteristics of an ignitable waste include the following properties:

- A liquid that has a flash point of less than 140°F as determined by a specific test method. This does not include aqueous solutions containing less than 24% alcohol by volume.
- It is not a liquid but is capable of causing fire through friction, absorption of moisture, or spontaneous chemical changes under standard temperature and pressure conditions.
- It is an ignitable compressed gas.
- It is an oxidizer.

A waste exhibiting any of these characteristics of ignitablility is identified for regulatory purposes with an EPA hazardous waste number of D001.

CHARACTERISTIC OF CORROSIVITY

A waste exhibiting the characteristic of corrosivity will dissolve metal or burn the skin. Examples of corrosive wastes include waste rust removers, waste acids and alkaline solutions, and waste battery acids. The specific characteristics of a corrosive waste include the following:

- o An aqueous waste with a pH less than or equal to 2.0 or greater than or equal to 12.5 as determined by an EPA-approved method.

- A liquid which corrodes steel at a rate greater than 6.35 millimeters (0.250 inches) per year at a temperature of 130°F as determined by specific test methods.

A waste exhibiting any of these characteristics of corrosivity is identified for regulatory purposes with an EPA hazardous waste number of D002.

CHARACTERISTIC OF REACTIVITY

A waste exhibiting the characteristic of reactivity is one that is unstable or undergoes rapid or violent chemical reactions with water or other material. Examples of reactive wastes include cyanide plating wastes, waste bleaches, and other waste oxidizers. The specific characteristics of a reactive waste include the following:

- It is normally unstable and readily undergoes violent changes without detonating.
- It reacts violently with water.
- It forms a potentially explosive mixture with water.
- It generates toxic gases, vapors, or fumes when mixed with water.
- It is a cyanide or sulfide bearing waste which can generate toxic gases, vapors, or fumes when exposed to pH conditions between 2.0 and 12.5.
- It is capable of detonation or a explosive reaction under standard temperature and pressure conditions or if subjected to a strong initiating source or if heated.

A waste exhibiting any of these reactive characteristics is identified for regulatory purposes with an EPA hazardous waste number of D003.

CHARACTERISTIC OF EP TOXICITY

EPA has designed a leaching test, called the Extraction Procedure (EP), to measure the amount of toxic materials that can be extracted from the waste under specific conditions. If the extract obtained from the test exceeds set concentration limits for certain constituents, the waste will be

considered hazardous. The EP toxicity test is used to determine whether leachate from disposal of a particular hazardous waste will pollute ground water.

There are 14 constituents that EPA has established concentration limits for in the EP toxicity test, including eight metals and six pesticides. Each of these contaminants has been assigned a specific EPA hazardous waste number. These contaminants, their associated EPA hazardous waste number, and the established concentration limits are listed in Table B-1. If a representative sample of a waste if found to contain any of the contaminants listed in this table at a concentration greater than or equal to those limits specified, the waste is considered an EP toxic hazardous waste.

APPENDIX C: REFERENCES AND CONTACTS

FEDERAL REGULATIONS

Code of Federal Regulations: The RCRA regulations addressed in this manual are referenced in the Code of Federal Regulations, Title 40, Parts 260 to 272.

Copies of the Code of Federal Regulations are available in most large public libraries. They may also be purchased from the Government Printing Office by calling (202) 783-3238.

RCRA Hotline: As a public service, the U.S. Environmental Protection Agency has provided a RCRA Hotline where anyone can call for technical or administrative information regarding the RCRA regulations.

The phone number for the RCRA Hotline is: 1-800-424-9346 (Hours from 8:30 a.m. to 4:30 p.m. EST, Monday through Friday)

References:

(1) "Understanding the Small Quantity Generator Rules: A Handbook for Small Business", published by EPA, Office of Solid Waste and Emergency Response, September, 1986. (EPA Publication No. EPA/530-SW-86-019) This is a handy, easy-to-read, reference for understanding the small quantity generator regulations.

(2) Handbook of Hazardous Waste Management for Small Quantity Generators, by Russell.W. Phifer and William .R McTigue, Jr., Lewis Publishers, Inc., 1988. This book provides a guide to the small quantity generator requirements, waste types generated from various industries, liability considerations, and onsite and offsite management of hazardous wastes.

STATE REGULATIONS

Administrative Rules of Montana: The state regulations addressed in this manual can be found in the Administrative Rules of Montana, Rule 16, Chapter 44.

Montana Department of Health and Environmental Science (DHES): The DHES can provide assistance to anyone with questions or concerns about the federal and state regulations, compliance issues, or waste management practices.

For further information, contact the DHES, Solid and Hazardous Waste Bureau, Room B201, Cogswell Building, Helena, Montana, 59620. The phone number is: (406) 444-2821.

WASTE MANAGEMENT

Contacts:

Waste Exchange Program - This program, sponsored by the Montana Chamber of Commerce, is an informational exchange program designed bring together generators and users of a waste which have a reuse or recycling value. The program is intended to put generators in contact with waste users that can reuse the waste as a feedstock or substitute material in their operations. The Chamber of Commerce publishes a free newletter which lists both waste generators with potentially reusable waste materials, and users who are in the market for a particular reusable waste material.

The state chamber can be contacted at 110 Neill Avenue, Helena, Montana, 59601. The telephone number is (406) 442-2405.